A. Yes, that was published in 2006.

Q. But it hasn't been withdrawn.

A. No, it's an advisory.

Q. And you disagree with that, you and your lab?

A. No, it's not me and my lab. It's that since that time there have been numerous articles published and there's been a considerable change from that advisory forward as far as determining what a reasonable cutoff would be given that there are all of these products that do contain ethanol and can then form EtG. And even following Dr. Skipper through time, there are a number of different recommendations dependent on where it was in the time frame from 2006 to the present time and that's what I'm saying. At one time he recommended a cutoff of 250 and then in conjunction with Paul Cary, they recommended a cutoff of 500. I believe in some of his -- on his website or in some current literature, he recommends a cutoff of 1,000 up to 1,500. I mentioned that earlier. And so there is considerable discussion concerning what is a good cutoff and whether there truly is one that could absolutely delineate between exposure to secondary products and exposure to only ethanol.

Q. And you're aware that Dr. Skipper believes there is no known cutoff at this point, is that correct?

A. That's what his belief is, yes.

Q. And I don't want to belabor this too much here but you were the one that brought up during the course of trying to figure out what an appropriate cutoff is, one of the agencies that weighed in on it and one of the things that I assume that you used in making your determination is this research put out by the Substance Abuse and Mental Health Services Administration, correct?

A. Yes.

Q. Now, I got a few questions. You work for Redwood Toxicology, obviously?

A. Yes.

Q. And that's a private, for-profit company, is that correct?

A. Yes.

Q. And you're in the business of screening for drugs and/or alcohol?

A. Yes.

Q. Your primary business, I assume?

A. Yes.

Q. And if you know, approximately what percentage of that business might be for probation agencies throughout the country?

A. I don't have that absolute number, but I would say probably a third or a quarter of the business.

Q. And so it's known by your laboratory that in this context there could be possible court proceedings?

A. Yes.

Q. And, in fact, on your website, Redwood Toxicology's website, I believe you assure legally defensible results, isn't that correct?

A. Yes.

Q. Because if you don't have legally defensible results, that's probably going to mean less business for your laboratory, would that be correct?

A. I would assume so, but yes.

Q. Okay. Well, with respect to this letter that you authored today and sent to Mr. Widseth, it's been offered into and accepted into evidence I believe as Exhibit 2. I just have a few questions for you about that.

A. Yes.

Q. I'm sure you're quite familiar with that letter since you just authored it today, correct?

A. Yes, I had just done it earlier this morning.

Q. And really just to be fair and honest here to the Court and not that I'm trying to suggest that I just got this today. You had actually authored a letter to probation that contained most of this information some time ago, is that correct?

A. Yes.

Q. And I got that through discovery and so I was aware of that. There was just, it looks like there was some, I guess some, maybe an attempt to answer some specific questions for Mr. Widseth that might be in addition to what you had already put in your letter to probation, is that a fair characterization?

A. Yes.

Q. Now, specifically with respect to the first paragraph in this letter, you indicate that .02 to .06 of ingested ethanol is converted to ethyl glucuronide or EtG, is that correct?

A. Yes.

Q. You're aware that some people convert to EtG or get a higher level, you convert at a higher level. Some people can convert higher than others, is that correct?

A. Yes, similar to what I mentioned as far as the range that was seen when there was ethanol ingestion.

Q. And so are you aware that there's research that in some individuals this can be as high as .4?

A. I'm sorry, I don't have that information.

Q. Obviously, if that's correct, we're talking about instead of .2 to .6, in other words 2 to 6 percent, we're talking about 40 percent of ethanol being converted to EtG. That would be quite a difference,

obviously?

A. Yes.

Q. And if that's correct, that would certainly have a profound effect on interpretation of results, wouldn't it?

A. Yes. But I believe you said .4 percent and there's a difference between .4 and 40.

Q. Well, and just so we're clear here, you indicated .02 to .06. So that would be the equivalent in terms of 2 to 6 percent, right?

A. No. It's .02 percent to .06 percent, so in other words, it's a very small amount that's converted.

Q. My mistake. So then .4 percent obviously wouldn't be 40 percent, but it would be .4 percent?

A. Yes.

Q. But, in any event, it would be anywhere from six and a half to twenty times the research you cited?

A. Yes.

Q. Now, with respect to, I think you've kind of clarified this already, but with respect to the third paragraph you indicated that EtG is only detected in urine when ethanol has been ingested. And that isn't completely accurate, is it?

A. No, not based on the article that I had mentioned previously that there is a single article that does

suggest there can be formation if all the criteria are met that I mentioned previously.

Q. So you can create EtG within the body through kind of a fermentation process without actually ingesting any outside source of alcohol?

A. This is not in the body. This is in the bottle.

Q. Okay. But then you testified that that doesn't affect the EtS levels at all, right?

A. That's correct.

Q. And just one further point of clarification with respect to that paragraph. Ingesting, when you say ingesting alcohol, that can also include inhalation of fumes, is that correct?

A. Yes.

Q. Now, I believe when we talked on the telephone and you've testified, too, today that you believe that 500 nanograms per milliliter is an acceptable cutoff based upon research we have now?

A. Yes.

Q. I believe you also indicated to me, at least, that that might change with future research?

A. It will take the entire scientific community, but yes, it may change in the future.

Q. Obviously we've had significant change in the year since we've been using this testing about agreeing

on what is an acceptable cutoff?

A. That's correct.

Q. And is one of the reasons that -- well, let's talk a little bit about the research that has been done. Would it be correct to say that there hasn't been a huge number of test subjects that have been involved in these studies? We're not talking about hundreds of thousands or millions of people or anything like that.

A. Right. Correct, most of these studies are based -- are university based. Some of them are even international where -- anyway, they collaborate over the entire world, but a lot of the studies only include hundreds of samples and not thousands on thousands of samples.

Q. And we've already covered the fact that different people metabolize EtG or I guess metabolize into EtG at different rates than others?

A. Yes.

Q. And so certainly once we have a research that covers a larger number of people, we might have more accurate results?

A. Yes. And also it may be -- I'm sorry, maybe I can't hear, but it may be that the determination is made that EtS may be a more viable marker than EtG is, but that has not been -- that hasn't been approached yet.

Q. Now, with respect to what we would call incidental exposure to alcohol, I guess I assume what we're talking about there is not the intentional consumption of an alcoholic beverage, but exposure to alcohol in some other way like hand sanitizer or something like that?

A. Yes.

Q. And most of these studies that you've read and you're citing, they involve one specific incidental exposure, like hand sanitizer alone, correct?

A. Yes. There haven't been currently, to my knowledge, ones that use multiple exposures.

Q. But it stands to reason that a combination of outside sources that one would be exposed to would cause those levels to go higher, wouldn't it?

A. Yes. In most cases these are levels that would be the use of these secondary type products in excess of recommended dosage.

Q. Correct. But I'm saying if you have multiple sources of outside exposure, let's say hand sanitizer, cough medicine, things like that, they compound upon one another, correct?

A. If it is ethanol that is ingested and it's ingested in larger quantities or in excess, it will have a positive EtG in a higher amount. Am I still here?

Q. I didn't lose you here. Maybe I'm not asking the question right here. Say, for example, you're exposed to hand sanitizer. That might cause a positive EtG or EtS result, correct?

A. Yes.

Q. And depending on how much of that you were exposed to, the level might be higher or lower, is that correct?

A. Yes.

Q. Let's just say, for example, you were exposed to hand sanitizer and some other form of alcohol, such as -- well, whatever it may be, cough medicine that contains ethanol or alcohol, that would also affect ones EtG or EtS levels, correct?

A. Yes.

Q. And, again, depending on the amount exposed to might be higher or lower?

A. Yes.

Q. But if those two things were -- if you were exposed to those two things within a time period, both of those two things, they would each affect the EtG or EtS levels, so we would expect that it would be higher than exposure to one substance alone, is that fair?

A. Yes.

Q. Now finally, Mr. Martin, the last paragraph of

your letter indicates that "although there is a possible exposure to commercial products containing ethanol, I am not able to rule out the additional ingestion of ethanol." So I know exactly what you're saying there, you're indicating you're not able to rule out the additional ingestion of ethanol, meaning you're not able to rule out that this individual consumed an alcoholic beverage.

A. My intent there is to say that there can be EtG produced if there is a secondary exposure. In this case it was mentioned as a hand sanitizer, but those levels that had been indicated in the literature are considerably lower than the levels that are on this report and so it suggests that it would not only be, if it was hand sanitizer, but hand sanitizer in addition to other ingested ethanol.

Q. Well, so you're not able to rule out the additional ingestion of ethanol. In other words, you're not able to rule it in either, are you?

A. Something caused it to be positive.

Q. Right. And you're not able to rule out drinking, but you're not able to rule it in either, are you?

A. Correct.

MR. GUDMUNDSON: I have no further questions.

THE COURT: Mr. Widseth.

REDIRECT EXAMINATION

BY MR. WIDSETH:

Q. Dr. Martin, let's just go back to that point and let's start, first of all, with the cutoff level here. The cutoff level of 500 nanograms per milliliter that you talked about, is that generally accepted, at least in the testing industry?

A. It is what was originally recommended by the drug court professionals and specifically two of the principals for EtG in the United States.

Q. And one of those actually was Dr. Skipper, wasn't it?

A. Yes, it was.

Q. And, in fact, I think you reference a report that he wrote where he put essentially that current analyses suggest that if levels of EtG in urine exceed 500 milligrams per liter, incidental exposure is extremely unlikely. You cited that in your report, is that correct?

A. Yes, I believe that may have been Paul Cary and not Dr. Skipper, but they both were at the same conference.

Q. Okay. But if that was in one of Dr. Skipper's reports, you wouldn't have any reason to -- I mean, you

said it came from two of the principal people and you're talking about Cary and Skipper, is that correct?

A. Yes.

Q. And have you seen anything in the testing that's been done since Mr. Gudmundson references the advisory in 2006? Have you seen anything in the testing that has been completed and has been accepted in the scientific community out there which would indicate that those cutoff levels are too low?

A. Particularly Dr. Skipper has indicated that there could be cutoff levels as high as a thousand or 1,500. There's also articles that are due to be presented next month that looks back at and this is -- I'm sorry, please stop me if I go to far, but it looks at trying to use something similar to what we used in the laboratory with cannabinoids or THC and trying to get a level playing field and so they look at the concentration of the urine in relationship to the EtG so that all samples could be equated to a hundred milligrams per DEL of creatinine. And by doing that then they could go back through all of the studies that have been done previously to try to determine what a cutoff would be using this -- it's referred to as normalized nomenclature, but seeing as how that's not published, I do know that they were going to try to use if anything

was greater than 300 nanograms per mL of EtG, as it would be normalized to 100 milligrams of creatinine.

I'm sorry to bring those mathematical equations in, but all I'm saying there's an attempt, there is an attempt to try to standardize the concentration of EtG in all of the urines that have been in previous studies and to determine if there could be a reasonable -- a cutoff used based on that information.

Q. And at least the information that's available right now, you're comfortable with a cutoff level of 500 milligrams or nanograms per milliliter, is that correct?

A. Yes.

Q. And at least from your review of the literature that would be supported by the scientific literature in this area, is that correct?

A. Yes.

Q. And where you put the cutoff level, has that been dictated by your company's interest in making profits here?

A. No.

Q. That really doesn't have any affect on how many tests you perform where you put the cutoff level, is that correct?

A. Correct.

MR. WIDSETH: I don't have any further questions, Your Honor.

THE COURT: Mr. Gudmundson.

RECROSS-EXAMINATION

BY MR. GUDMUNDSON:

Q. Mr. Martin, I just have a couple more questions for you about the author -- or the letter you authored to Mr. Widseth. At the top of page 2, first paragraph there, you indicated that, paraphrasing, EtG concentrations in excess of 10,000 nanograms per milliliter are consistent with the recent ingestion of increased concentrations of ethanol or following chronic ethanol consumption. First of all, I assume recent increased concentrations of ethanol would be somebody drinking a pretty large quantity of alcohol shortly before testing?

A. Recent within probably eight to ten hours is recent. If an EtG is taken right after someone has drank a large quantity of ethanol, it may not be likely that the EtG would be detected. The ethanol would be detected, but the EtG may not be detected.

Q. And so then also with respect to following chronic ethanol consumption, what do you mean by that?

A. Binge.

Q. So if somebody has been drinking fairly large

quantities of alcohol or been drinking for several days, it's not uncommon to see levels above 10,000, is that right?

A. That's correct.

Q. What is the highest level you've ever seen in your experience in this test?

A. I don't recall my -- some of my record breakers, but I'm believing 500,000, 750,000, some extreme. We don't see those very often, but some extreme values.

MR. GUDMUNDSON: Thank you very much, Mr. Martin. I have no further questions.

THE COURT: Counsel, do you mind if I ask a couple of follow-up questions?

MR. WIDSETH: Not at all, Your Honor.

MR. GUDMUNDSON: No, Your Honor.

EXAMINATION

BY THE COURT:

Q. Mr. Martin, could I just ask you, you talked about creatinine and whether or not the urine samples are normalized to adjust for levels of creatinine. Is that something that your lab is doing or is that a new thing that is not really done yet?

A. There are articles that are being reviewed currently and are due to be given sometime in the next scientific sessions in the United States, but they

haven't been given yet, so it's still unpublished data, but I do know that the studies were done and those would fall under the same scrutiny as trying to establish any other cutoff levels.

Q. So your lab wouldn't necessarily normalize for creatinine levels and do you think that's significant at all in terms of an accurate reading?

A. What it does, yes, I do believe that it is a reasonable way to report them. It's just that at the current time we don't have any suggested values for cutoffs with a normalized sample, but it is a very good way to report then in that you can look at all the historical information that's been done up to this point and even in the future and be able to reasonably compare those studies to each other and so it is a very reasonable approach, but I don't know how that's going to be accepted in the scientific community and certainly we would report them as a normalized value if there is some type of agreement on that type of cutoff.

THE COURT: Counsel, any follow-up questions?

MR. WIDSETH: No, Your Honor.

MR. GUDMUNDSON: No, Your Honor.

THE COURT: Thank you very much. And I believe your testimony is now concluded, so thank you.

I hereby certify that the foregoing constitutes a full, true and correct transcript taken from my original stenographic notes on the date and at the place indicated herein.

Lisa Peterson, RPR
District Court Reporter
Crookston, Minnesota